

Service Manual



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Safety Notice

Any person attempting to service this chassis must familiarize with the chassis and be aware of the necessary safety precautions to be used when serving electronic equipment containing high voltage.

Product Announcement:

This product is certificated to meet RoHS Directive and Lead-Free produced definition. Using approved critical components only is recommended when the situation to replace defective parts. Vender assumes no liability express or implied, arising out of any unauthorized modification of design or replacing non-RoHS parts. Service providers assume all liability.

Qualified Repairability:

Proper service and repair is important to the safe, reliable operation of all series products. The service providers recommended by vender should being aware of notices listed in this service manual in order to minimize the risk of personal injury when perform service procedures. Furthermore, the possible existed improper repairing method may damage equipment or products. It is recommended that service engineers should have repairing knowledge, experience, as well as appropriate product training per new model before performing the service procedures.

NOTICE:

- ! To avoid electrical shocks, the products should be connect to an authorized power cord, and turn off the master power switch each time before removing the AC power cord.
- ! To prevent the product away from water or exposed in extremely high humidity environment.
- ! To ensure the continued reliability of this product, use only original manufacturer's specified parts.
- ! To ensure following safety repairing behavior, put the replaced part on the components side of PWBA, not solder side.
- ! To ensure using a proper screwdriver, follow the torque and force listed in assembly and disassembly procedures to screw and unscrew screws.
- ! Using Lead-Free solder to well mounted the parts.
- ! The fusion point of Lead-Free solder requested in the degree of 220°C.

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1.1 Scope:

This document defines the design and performance requirements for the 23" wide flat panel monitor. The display element shall be a 23" inch diagonal, Full HD (1920 x 1080) resolution TFT-LCD display (Thin Film Transistor Liquid Crystal Display) and support 60Hz Video input signals are one Analog D-sub and one DVI with non-interlaced signal. Power saving function complies with the VESA DPMS (Display Power Management Standard).

General display parameters:

Active screen size	23 inches(58.42cm) diagonal (Aspect ratio 16:9)
Outline Dimension	535.7(H) x 311.2(V) x 8.1mm(D, Top 8.2mm)(Typ.)
Pixel Pitch	0.265(H)mm x 0.265(V)mm
Pixel Format	1920 horiz. By 1080 vert. Pixels RGB stripes arrangement
Interface	mini-LVDS 1 Port 6 pin, Power, Source and Gate control signals
Color depth	16.7M colors (When use Advanced FRC)
Luminance, white	250 cd/m ² (Center 1/Point, typ)
Viewing Angle (CR>10)	R/L 170(Typ.), U/D 160(Typ.)
Power Consumption	Total 20.6 W(Typ.), (7.0 W@VLCD, 13.6 W@W/O Driver)
Weight	1,430 g (Typ.)
Display operating mode	Transmissive mode, Normally White
Surface treatments	Hard coating (3H), Anti-glare treatment of the front polarizer
Color Gamut	72%(Typ.) CIE 1931

Optical Characteristics:

Parameter	Symbol	Values			Units	Notes
		Min	Typ	Max		
Contrast Ratio	CR	706	1000	-	-	1 (PR-880)
Surface Luminance, white	L _{sp}	206	250	-	cd/m ²	2 (PR-880)
Luminance Variation	ΔL _{norm}	3P	73	-	%	3 (PR-880)
Response Time	Rise Time	T ₉₀	-	1.2	ms	4
	Decay Time	T ₉₀	-	3.7	ms	(RD01G)
Color Coordinates [sRGB/NTSC]	RED	R _r	Typ 0.63	0.638	Typ 0.63	(PR-880)
		R _y		0.331		
		R _b		0.316		
	GREEN	G _r		0.624		
		G _y		0.193		
		G _b		0.096		
	BLUE	B _r		0.213		
		B _y		0.096		
		B _b		0.069		
	WHITE	W _y		0.629		
Viewing Angle (CR>10)						5 (PR-880)
x axis, right (α=0°)	α	75	83		Degrees	
	α axis, left (α=180°)	α	75	83		
	y axis, up (β=0°)	β	75	83		
	y axis, down (β=270°)	β	75	83		
Viewing Angle (CR>10)	x axis, right (α=0°)	α	75	83		
	x axis, left (α=180°)	α	75	83		
	y axis, up (β=0°)	β	75	83		
	y axis, down (β=270°)	β	75	83		
Gamma				1.3	%	6 (PR-880)
Luminance uniformity - Angular dependence (100 % n)	U _A	-	-	1.73		7 (PR-880)
Color grayscale linearity	ΔuV'		0.038			8 (PR-880)

1.2 General Requirements:

1.2.1 Test Condition:

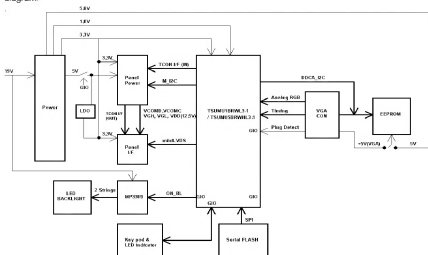
Normal test condition is that brightness level set at Max. and contrast level set default. Test pattern is full white pattern. The warm up time is more than 30 minutes. Ambient light should be less than 1 Lux.

1.2.2 Test Equipment:

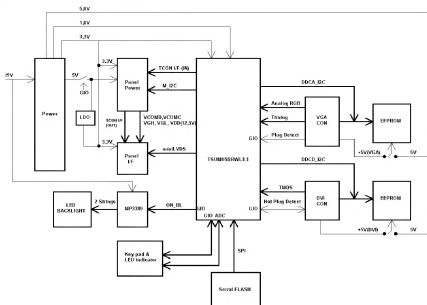
The reference signal source is a calibrated Chroma 2326 or Quantum 801GD video generator. The use of compatible generators during qualification and production is acceptable. Luminance meter is Minolta CA210, TOPCON BM7 or compatible equipment.

1.3 Electrical:

This section describes the electrical requirement of the pure A and A+D monitor. Below is the pure A monitor's block diagram.



And, below is A+D monitor's block diagram.



1. Product Specification

This LCD monitor includes an interface board, power adaptor and a function key board. The interface board controls the TFT panel control logic, brightness control logic, and DC-DC conversion to supply the appropriate power to the whole board and LCD panel then transmitting LVDS signals into LCD Module to drive the LCD display circuit. The power adaptor will provide the DC power to the interface board and LCD panel. The function key board is used for OSD control, monitor power ON/OFF and the LED indicator for power status.

ITEM		SPEC
Analog Signal Input	Frequency Ranges	H 30kHz ~ 83kHz, V 56Hz ~ 75Hz
	Max Pixel clock	173MHz
	RGB Input Level	0.7Vp-p
	RGB Input Impedance	75 Ω
	Sync Input Signal	Separate SYNC,
	Sync Input Impedance	2.2K Ω
DVI (Digital Video Interface)	Frequency Ranges	H 30kHz ~ 83kHz, V 56Hz ~ 75Hz
	Max Pixel clock	165MHz
	Input Level	150mV<=Vp-p<=1560mV
	Input Impedance	100 Ω
Connectors	HDCP	HDCP 1.0
	DC Jack (power adaptor)	19V, 2.1A,
Power Consumption	Input connectors	D-SUB 15 pin , DVI 24pin
	AC IN 90-264V Normal Operation	30W Max
	Power Saving	< 0.6 W @ (110VAC) / < 0.7 W @ (220VAC)
	Power Off	< 0.53W @ (110VAC) / < 0.63 W @ (220VAC)
User's Control	Front Panel Buttons	POWER, Right, Left, MENU, AUTO, E
Dimming control range(max-min/max) x 100%		100%
Pre-Defined Timing	Preset Timing	29
	User's Timing	9
Plug and Play		VESA DDC2B
Power Saving		DPMS

1.3.1 Interface Connectors:

1.3.1.1 DC Jack, Power Adaptor:

The AC inlet connector shall be an IEC/CEE-22 type male power receptacle for connection to mains power. The power cord shall be black with length of 1.5±0.05 meters. The power cord type is different from regions.

1.3.1.2 Analog Connector and Cable: The analog signal cable shall be black and 1800 mini-meters. The analog VGA cable shall be a molded-over, shielded, triple row, 15 pins and blue color D type connector.

A. D-SUB

Pin	Signal	Description	Pin	Signal	Description
1	Red Video	Red video signal input	9	+5V	+5V from host system
2	Green Video	Green video signal input	10	DCC-GND	Ground for signal
3	Blue Video	Blue video signal input	11	N.C.	No connection
4	Ground	Ground	12	SDA	I2C SDA for VESA DDC2B
5	VGA Detect	VGA connection detection	13	H Sync	Horizontal sync signal
6	Red Gnd	Ground for Red video	14	V Sync	Vertical sync signal
7	Green Gnd	Ground for Green video	15	SCL	I2C SCL for VESA DDC2B
8	Blue Gnd	Ground for Blue video			

B. Key Board connector

Key Board connector: J1

Pin	Signal	Description	Pin	Signal	Description
1	Key1	ADC1	5	LED_CONN	LED blue control
2	Key2	ADC2	6	GND	Ground
3	PWR_KEY	Power On/Off control	7	3V3D_REG	3.3V supply power
4	NC	No connection			

C. Backlight connector

Backlight connector BJ1

Pin	Signal	Description	Pin	Signal	Description
1	LED_ST2		6	VDD_LED DRV	
2	NC	No connection	7	NC	No connection
3	NC	No connection	8	NC	No connection
4	NC	No connection	9	NC	No connection
5	VDD_LED DRV		10	LED_ST1	

D. DVI connector

Pin	Signal	Description	Pin	Signal	Description
1	CH2-	TMDS negative input of CH2	13	NC	No connection
2	CH2+	TMDS positive input of CH2	14	Power	+5V
3	Logic Ground	Ground	15	Plug Detect	Detect cable plug in
4	NC	No connection	16	Sense pin	Sense pin/pull high
5	NC	No connection	17	CH0-	TMDS negative input of CH0
6	DDC2B SCL	I2C SCL for VESA DDC2B	18	CH0+	TMDS positive input of CH0
7	DDC2B SDA	I2C SDA for VESA DDC2B	19	Logic Ground	Ground
8	NC	No connection	20	NC	No connection
9	CH1-	TMDS negative input of CH1	21	NC	No connection
10	CH1+	TMDS positive input of CH1	22	Logic Ground	Ground
11	Logic Ground	Ground	23	CLK+	TMDS positive input of Clock
12	NC	No connection	24	CLK-	TMDS negative input of clock

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1. Product Specification

E. Flat Panel Connector

a. Input signal connector of mini-LVDS

Pin	Signal	Description	Pin	Signal	Description
1	GND	Ground	26	VCOMC	VCOMC Voltage
2	LV5-	Mini LVDS Receiver Signal(5-)	27	VCOMC	VCOMC Voltage
3	LV5+	Mini LVDS Receiver Signal(5+)	28	VCOMD	VCOMC Voltage
4	LV4-	Mini LVDS Receiver Signal(4-)	29	VCOMD	VCOMC Voltage
5	LV4+	Mini LVDS Receiver Signal(4+)	30	VCC	Logic Voltage
6	LV3-	Mini LVDS Receiver Signal(3-)	31	VCC	Logic Voltage
7	LV3+	Mini LVDS Receiver Signal(3+)	32	VDD	Panel Driving Voltage
8	GND	Ground	33	VDD	Panel Driving Voltage
9	LVCLK-	Mini LVDS Receiver Clock Signal-	34	VDD	Panel Driving Voltage
10	LVCLK+	Mini LVDS Receiver Clock Signal+	35	VGH	Gate High Voltage
11	GND	Ground	36	VGH	Gate High Voltage
12	LC2-	Mini LVDS Receiver Signal(2-)	37	VGL	VGL voltage
13	LV2	Mini LVDS Receiver Signal(2+)	38	VGL	VGL voltage
14	LV1-	Mini LVDS Receiver Signal(1-)	39	G_RES	GIP Reset Pulse
15	LV1+	Mini LVDS Receiver Signal(1+)	40	GVDD_E	GIP Panel VDD for Even Gate TFT
16	LV0-	Mini LVDS Receiver Signal(0-)	41	GVDD_O	GIP Panel VDD for Odd Gate TFT
17	LV0+	Mini LVDS Receiver Signal(0+)	42	CLK4	GIP GATE Clock4
18	GND	Ground	43	CLK4	GIP GATE Clock4
19	SOE	Source Output Enable SIGNAL	44	CLK3	GIP GATE Clock3
20	POL2	Polarity Control Signal	45	CLK3	GIP GATE Clock3
21	POL	Polarity Control Signal	46	CLK2	GIP GATE Clock2
22	CSC	Charge Share mode control Signal	47	CLK2	GIP GATE Clock2
23	HSDOT	Horizontal 2 Inversion Signal	48	CLK1	GIP GATE Clock1
24	CLK_REST	Vertical Start Plus	49	CLK1	GIP GATE Clock1
25	GND	Ground	50	GND	Ground

b. Input signal connector of LED Backlight power

Pin	Signal	Description	Pin	Signal	Description
1	FB1	Channel1 current Feed Back	6	Vled	LED Power supply (common Input)
2	NC	No connection	7	NC	No connection
3	NC	No connection	8	NC	No connection
4	NC	No connection	9	NC	No connection
5	Vled	LED Power supply (common Input)	10	FB2	Channel2 current Feed Back

1.3.2 Input Signals:

Video Input Signals Range(Analog RGB Signal)

No.	Symbol	Item	Min	Max	Unit	Remark
1	Fh	Horizontal Frequency	30	83	kHz	Minimum range
2	Fv	Vertical Frequency	50	75	Hz	Minimum range
3	Fclk	Pixel Clock Frequency		173	MHz	
4	Vih	Hi Level Input	2	5	V	Note 1)
5	Vil	Low Level Input	0	0.8	V	Note 1)
6	Video	RGB Analog Video Level	0	0.735	V	75 Ω to Ground

Note 1) 2.2k Ω to Ground. Schmitt-Triggers Input. Support 3.3V H & V SYNC Output device.

1.3.2.1 Video Signal Amplitudes:

The video inputs consist of Red, Green and Blue signals each has its own coaxial cable terminated at the monitor. These video signals are analog levels, where 0V corresponds to black, and 735mV is the maximum signal amplitude for the respective color. The video signal is terminated with 75 ohms.

1.3.2.1 Video Signal Amplitudes:

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1.3.2.2 Video Signal Termination Impedance:

The analog video signal termination shall be 75 ohm +/- 2%.

1.3.2.3 Synchronization (Sync) Signals:

The Horizontal Sync (HS) TTL signal is used to initiate the display of a horizontal line. HS may be either active high or active low according to the timing. The Vertical Sync (VS) TTL signal is used to initiate the display of a new frame. VS may be either active high or active low according to the timing.

1.3.2.4 Sync Signal Levels:

The monitor must accept sync signals from both 3.3 and 5 volt TTL logic families. The inputs shall sense a logic 0 when the input is 0.8 volt or less and shall sense a logic 1 when the input is 2.0 volts or greater. In addition to these level requirements, there shall also be a minimum of 0.3 volt hysteresis provided for noise immunity (typically by using a Schmitt Trigger input). That is, the input level at which the monitor actually detects a logic 0 shall be at least 0.3 volt lower than the level at which it actually detects a logic 1. If the monitor sync processing circuits were designed with 3.3 volt logic family, then the sync inputs must be 5 volt tolerant.

1.3.2.5 Sync Signal Loading:

TTL input loading shall be equivalent to one TTL input load. When logic 0 is asserted by a sync input, the maximum current source from any single monitor sync input to the driver is 1.6 mA. When logic 1 is asserted, the maximum current source from the driver to any single monitor sync input is 400 uA.

1.3.2.6 Abnormal Signal Immunity:

The monitor shall not be damaged by improper sync timing, pulse duration, absence of sync, abnormal input signal amplitude, or any other anomalous behavior of a graphics card.

1.3.2.7 Digital TMDS Input (DVI signal input):

These video inputs consist of TX0+/- to TX2+/- and CLK+/- signals, each with its own shielded twisted pair. These video signals are digital levels. Each signal pair is terminated by a normal 100 ohms.

1.3.3 User Controls and Indicators:**1.3.3.1 Power On/Off Switch:**

The monitor shall have a power control switch visible and accessible on the front of monitor.

1.3.3.2 Power Indicator LED:

The monitor shall have LED indicators located on the front of the monitor. Table 1 is the LED color for the power indicator.

LED light	Status	Remark
Off	Power off	
Blue	Power on	Signal is alive
Blinking Blue	Standby/power saving	No signal

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1.3.3.3 On-Screen Display:

On Screen Display system shall be used to control the monitor. Current setting will be saved and OSD will be tuned off when the keys are not touched for a period of time.

A) Key Function Overview:

All functions are controlled by OSD buttons on the front of front bezel.

Buttons	Names	Description
1	E Key	Press "E key" button to show the first menu. Press this button again to select different preset display scenarios.
2	Auto/Exit	As the input source is D-Sub, press this key to activate the Auto function. Press this key to exit OSD.
3	Menu/Enter	Press MENU button to activate the first menu. Press this button again to enter the main menu.
4	Select "←"	This button allows the user to move up between OSD items and decrease the value of sliding bar.
5	Select "→"	This button allows the user to move down between OSD items and increase the value of sliding bar.
6	Power	After AC on by plugging in a power cord and pressing Power button, LED indicator turns to blue to indicate power on. To turn off this device, press this button again.

B) Menu Operation:

Pressing the MENU button brings up the first level menu. This menu button is used to enter the second OSD menu also.

1 st Sub	2 nd Sub Menu	3 rd Sub Menu	4 th Sub	Value	VGA
Picture	Acer Color management				v
	Brightness	Slider		[100] 0-100 / 1	v
	Contrast	Slider		[50] 0-100 / 1	v
	H. Position	Slider		50-100 / 1	v
	V. Position	Slider		50-100 / 1	v
	Focus	Slider		[50] 0-100 / 1	v
	Clock	Slider		[50] 0-100 / 1	v
	Color Temp	Cold		83 50K	v
		[W arm]		65 50K	
		User	Red	0-100	
			Green	0-100	
			Blue	0-100	v
	Auto Config				v
OSD	OSD Timeout			[15] 10-120	v
Setting		Full			v
	Wide Mode	Aspect			v
	DDCCI	On/Off			v
	ACM	On/Off			v
	Input	VGA			v
	Language	(E MEA)			v
		English, Russian, French, Spanish,			
		German, Italian, Dutch, Turkish			
		Polish, Portuguese			
		Finnish			
		Russian			
		(NON EMEA)			
		English, French, Spanish, Germany, Italian, T.Chinese, S.Chinese, Japan			
	Reset				v
Information		Resolution HW frequency XXXK input Serial number			v

1. Product Specification

C) OSD Function.

No Signal	This function gives a warning message when selected input signal is not active. When the Monitor detected that the VGA or DVI is suspend or standby mode. The Monitor shall display a message, "No Signal" for 3 seconds and the LED shall be blue, and to alert the user that input signal is not active. Then the monitor shall go into sleep mode and the LED shall be Blinked
Input not support	This function gives warning message about input resolution or refresh rate that the monitor cannot support. When an input signal which is out of the normal operation range defined in Section 1.3.4.2 Then the monitor will display "input not supported" message 1. Pixel clock frequency: 173MHz 2. V-sync frequency 55Hz > FV > 75Hz 3. H-sync frequency: 30KHz > FH > 80KHz
Cable not connect	This function gives warning message when the VGA cable is not connected. When the Monitor detected that the VGA cable is not connected to the monitor. The OSD shall display a message "Cable not connected" all the time to alert the user that the video cable is not plugged in. The LED shall be blue. The monitor shall use a method of a pull-up resistor on a ground pin to determine if the video cable is connected to the PC.

D) OSD Control Factory Default Values

The OSD controls shall have the following factory default values.

Brightness: 100 Contrast: 50

Color Temperature: Warm(6500)/Cool(9300)/User (R/G/B all are 100)

Horizontal Position of Screen: Hor. 50, Ver. 50

OSD Timeout: 10 seconds

OSD Language: English

1.3.4 Monitor Modes and Timing Capability

1.3.4.1 Format and Timing:

The monitor shall synchronize with any vertical frequency from 50 to 75 Hz, and with any horizontal frequency from 30 to 83 KHz for analog input and DVI input. If the input frequency is beyond the specified range, the monitor shall display a warning screen indicating that the input frequency is out of range. Under no circumstances shall any combination of input signals cause any damage to the monitor

1.3.4.2 Factory Assigned Display Modes

There are 25 factory pre-set video modes. Pre-defined mode parameters will be recalled if the operating mode is one of those pre-set modes. If the operating mode is not one of those stored in memory, the monitor CPU will select the PRESET timing for a mode that is the next lowest in horizontal scanning frequency. The screen parameters can be adjusted by the front bezel control buttons and then saved as a user defined mode. The monitor shall include all the preset video timings shown in the following table

Item	Resolution (k H x)	H-Sync (k H x)	V-Sync (Hz)	Band Width (MHz)	Pixel (MHz)	Clarity (MHz)	Source
1	640x480	31.463	53.94	25.175	-	-	VE SA
2	640x480	25	60.60	20.24	-	-	MC
3	640x480	27.981	72.809	31.6	-	-	VE SA
4	720x480	31.463	70.067	28.322	-	-	VE SA
5	800x600	35.156	60.25	36	+	+	VE SA
6	800x600	37.875	60.317	40	+	+	VE SA
7	800x600	48.077	72.100	50	+	+	VE SA
8	1024x768	49.363	60.004	65	-	-	VE SA
9	1024x768	56.478	70.069	75	-	-	VE SA
10	1152x864	67.5	75	105	+	+	VE SA
11	1280x720	44.955	53.94	74.176	-	-	CE A
12	1280x800	49.702	53.91	83.6	-	-	VE SA
13	1280x860	60	60	105	+	+	VE SA
14	1280x1024	63.901	60.02	105	+	+	VE SA
15	1360x768	47.712	60.02	85.5	+	+	VE SA
16	1440x900	56.938	63.88	106.5	-	-	CT
17	1680x1060	65.29	59.95	146.25	+	-	CT
18	1600x1200	75	60	162	+	+	VE SA
19	1920x1080	67.158	55.96	173	+	-	CT
20	1920x1080	67.5	60	148.5	+	-	CE A
21	1920x1080	66.667	63.90	136.5	+	-	CT-RTD

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1.3.5 Controller Requirements

1.3.5.1 General Requirements

The monitor shall include a controller which is capable of converting the analog RGB signal or DVI digital signal to the panel. The controller will include a PLL, A/D converters, TMDS receiver and other circuitry necessary to perform its function. The PLL shall be stable enough to ensure a stable image.

1.3.5.2 Video Stretching

The monitor shall have the function to "stretch" the video signal, so that an input signal from the computer in any resolution smaller than 1920x1080 is automatically expanded to fill the entire screen.

1.3.5.3 Panel Timing and Interface

The controller supplied with the monitor shall control all panel timing. This controller shall adequately insulate the monitor from the computer, so that no possible combination of input signals from the computer shall cause damage to the flat panel or any other component of the monitor.

1.3.6 Power Adaptor Requirements

The AC to DC power adaptor for this monitor shall be a DC power supply. This power adaptor shall have an IEC receptacle for mains power input and provide sufficient power for backlight assembly, interface board and panel. And it should meet all requirements specified in following Table.

AC TO DC Converter Requirement	
Input Voltage Range	The operating range shall be from 90 to 264 VAC sinusoidal for all models specified.
Input Frequency Range	Input power frequency range shall be from 47 to 63Hz.
Power Consumption	Power consumption for the monitor shall be less than 30W over the specified voltage and frequency ranges. In power off mode the power consumption will be less than 0.5W (at 110VAC).
Line Fuse	The AC input shall be fused and become electrically open as a result on an unsafe current level. The fuse may not user replaceable.
Initial Cold Start	The power adaptor shall start and function properly when under full load, with worst case conditions of input voltage, input frequency, operating temperature, and cold backlight LED.
Inrush Current	The inrush current must be limited to when operated at 120VAC, and when operated at inrush current is measured at an ambient temperature of 25°C, with the unit temperature stabilized in the power off.
Hot Start Cycle	The power adaptor shall not be damaged when power ON for one second and OFF for one second for seven consecutive times after operating for one hour at full load, 25°C, and nominal input line voltage.
Under Voltage	The power adaptor shall contain protection circuitry such that the application of an input voltage below the minimum specified in this table shall not cause damage to the power adaptor unit nor cause failure of the input.
Line Transient	The power adaptor shall operate within EN 61000-4-4 (+/-1KV) and EN 61000-4-3 (+/-2KV). The power adaptor shall operate and comply with CE mark.

1.3.7 Display Communications Channel

The monitor shall provide a display communications channel that conforms to VESA DDC2B hardware requirements. This configuration shall contain the 128-byte EDID file as specified by VESA E-EDID Standard. Once the EDID is programmed the write protection function will be enabled. So the EEPROM data cannot be overwritten.

1.4 Flat Panel:

1.4.1 General Requirements

The panel shall be a FULL HD resolution 23" diagonal TFT-LCD

1.4.2 Panel Timings:

The controller in the monitor shall translate video timings from the PC to meet the timing requirements listed in Panel specification. Under no circumstances may the controller supply the panel with timings that may result in damage. The controller shall insulate the panel from the PC, so that the panel shall always be driven according to its specification regardless of the timings being sent from the PC.

1.4.3 Polarizer Hardness:

The outer face of the front polarizer panel shall be covered with a coating with a 3H hardness value.

1.4.4 Backlight Requirements

1.4.4.1 General Requirements

The LED shall have a continuous operating life of at least 30000 hours at 25°C. The operating life is defined as having ended when the illumination of light has reached 50% of the initial value. The LED shall extend a sufficient amount from the edge of the light guide that sputtering over the life of the lamps shall not cause degradation of the luminance uniformity (such as non-illuminated bands along the edges of the display).

1.4.5 Defects:

1.4.5.1 Visual Inspection

The LCD panel shall be inspected with all pixels set to white, black, red, green and blue. The color variation, brightness variation, and overall appearance must meet the SPEC.

1.4.5.2 Display Degradation

Over the life of the product, variation of the parameters specified in Panel specification shall be maintained within reasonable limits. The panel must not exhibit any significant defects while in operation. This does not in any way change the warranty given by the panel manufacturer.

1.4.5.3 Light Leakage

Except for the active display area, there shall be no light emission visible from any angle from any other part of the display. For this test, the ambient illumination will follow the panel specification 300 to 700 lux.

1.4.5.4 Allowable Defects:

No cosmetic defects are allowed except those specified below. The conditions of visual inspections are as follows.

- Viewing distance: 35~50cm
- Ambient illumination: 300 to 700 lux
- Viewing angle range shall be 170 degrees Horizontal and 160 degrees vertical typically

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- Defects not apparent within one minute shall be ignored.

1.4.5.5 Defect Terminology

Dark Spots / Lines Spots or lines that appear dark in the display patterns and are usually the result of contamination. Defects do not vary in size or intensity (contrast) when contrast voltage is varied. Contrast variation can be achieved through the use of varying gray shade patterns.

Bright Spots / Lines Spots or lines that appears light in the display patterns. Defects do not vary in size or intensity (contrast) when contrast voltage is varied. Contrast variation can be achieved through the use of varying gray shade patterns.

Polarizer Scratch When the unit lights, lines appear light (white) with display patterns dark and do not vary in size. Physical damage to the polarizer does not damage the glass.

Polarizer Dent When the unit lights, spots appear light (white) with display patterns dark and do not vary in size. Physical damage to the polarizer does not damage the glass.

Bright/Dark Dot A sub - pixel (R, G, B dot) stuck off / on (electrical)

1.4.5.6 LCD inspection method:

*Ambient conditions:

- a. Temperature : 20~25℃
- b. Humidity : 65 ± 10 % RH
- c. Illumination : Single 20W fluorescent lamp non-directive
(300 to 700 Lux)
Using Daylight type fluorescent light
Under Max 300Lux for Verifying Dot defects)

*Viewing distance:

The distance between the LCM and the inspector eyes shall be at least 35~50cm

● Dot Defect:

Bright Dot

Dots(sub-pixels) which appeared brightly in the screen when the LCM displayed only with Full Black pattern

- R, G, B 1 dot 2 Max
- Adjacent 2 dots 1 Max
- Total amount of Bright dots 2 Max
- Minimum distance of Bright dots 15mm

Dark Dot

Dots(sub-pixels) which appeared darkly in the screen when the LCM displayed with Full Red, Green and Blue patterns.

- 1 dot 4 Max
- Adjacent 2 dots 1 Max
- Total amount of Dark dot 4 Max
- Minimum distance of Dark dots 15 mm

Total amount of Dot Defects 5 Max(Combination)

Bright dot free rate 90%

Note) a) Every dot herein means Sub-Pixel(Each Red, Green, or Blue Color)

- b) Bright dot defect damaged less than half size of sub-pixel is not counted as a bright dot defect. And dark dot defect damage less than half size of sub-pixel is not counted as a dark dot defect.
- c) Dots darker than half brightness of sub-pixel are not defined as bright dot defect and dots brighter than half brightness of sub-pixel are not defined as dark dot defect.

1. Product Specification

● Polarizer Defects:

Items	Criteria
Scratches	$0.05 \leq W \leq 0.1$, $0.3 \leq L \leq 3.0$, $N \leq 3$
Dent/Bubble	$D \leq 0.7$, $N \leq 3$

Where, W : Width

L : Length

D : Average diameter $= (a+b)/2$

Note)

a : Average Diameter

b. Linear : $a > 2b$, Circular : $a \leq 2b$



Note) continued

c. Extraneous substances which can be wiped out, like Finger Print, Particles, are not considered as a defect.

b. Defects which is on the Black Matrix(outside of Active Area) are not considered as a defect.

1.5 Optical Characteristics

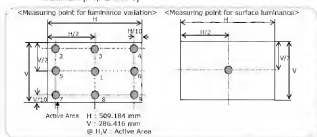
1.5.1 Brightness uniformity

The uniformity is determined by using a photometer (CA-210) to measure the 9 points luminance in front of monitor after at least 30 minutes warm up. It shall be test at 1920x1080/60Hz mode and full white square pattern with contrast / brightness in default value. The values specified are at an approximate distance 50 cm from the LCD surface and at 0 viewing angle

The 9 test points are defined as below.

The variation in surface luminance, δW is defined as

$$\delta W = \frac{\text{Minimum (P1,P2 \dots P9)}}{\text{Maximum (P1,P2 \dots P9)}} \times 100$$



$$\delta W = 75\% \text{ Min}$$

Remark The black luminance non-uniformity are no defined by panel spec, therefore, we don't define the spec for black luminance non-uniformity

1.5.2 Contrast ratio (CR)

1.5.2.1 General CR

The contrast ratio is determined by using a photometer (CA-210) to measure the maximum and minimum luminance in front of monitor after at least 30 minutes warm up. It shall be test at 1920x1080/60Hz mode and full white/full black square pattern with contrast/brightness in default value. The values specified are at an approximate distance 50cm from the LCD surface and at 0 viewing angle. The contrast ratio is calculated as below.

$$\text{Contrast ratio (CR)} = \frac{\text{Max. Surface luminance with all white pixels}}{\text{Max. Surface luminance with all black pixels}}$$

$$\text{CR} = 1000:1 \text{ typ. (typ)}$$

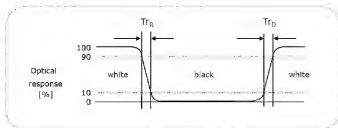
1.5.2.2 ACM (Auto Contrast Management)

The input image signal source may be various levels of illumination, and this ACM unit can analyze it as histogram for the various levels of illumination, according to the analyzed result, when input a low-luminance level image, display brightness will be adopted to corresponding low level, so that enhance the contrast rate, this facilitates visual ergonomics enhancement. The monitor should be CR >12000000:1 when ACM function is active

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1.5.3 Response time

The response time is defined as below

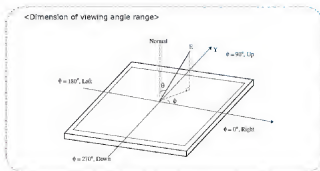


$Tr + Tf$ 5 msec typ

Remark Optical response time vs gray scale Test condition brightness set to max, and contrast set to default

1.5.4 Viewing angles

The viewing angles are measured at CR ≥ 10 as below



Horizontal Left 85 degrees typ , Right 85 degrees typ

Vertical Up 75 degrees typ , Down 85 degrees typ

1.5.5 Chromaticity

The color chromaticity is measured by a photometer (CA-210) at 1920x1080/60Hz mode and full white square pattern with contrast/brightness in default value. The x and y co-ordinates for Reddish, Bluish and User preset mode shall be as below.

Reddish Preset :

$x=0.313 \pm 0.015$

$y=0.329 \pm 0.015$

Bluish Preset :

$x=0.283 \pm 0.015$

$y=0.297 \pm 0.015$

1.5.6 Brightness:

The brightness is determined by using a photometer (CA-210) to measure luminance on the center of screen after at least 30 minutes warm up. It shall be test at 1920x1080@60Hz mode and the brightness and contrast OSD setting for 100%. The values specified are at an approximate distance 50 cm from the LCD surface and at 0 viewing angle. The full screen white center luminance at User mode color temperature shall be 250 cd/m² typ. And > 200 cd/m² min. Full screen black pattern luminance at center should be < 1cd/m².

1.6 Environmental Requirements:

1.6.1 Temperature Ranges:

Operating Temperature: 5°C
to 35°C Shipping
Temperature: -25°C to 60°C
Storage Temperature: -25°C
to 60°C

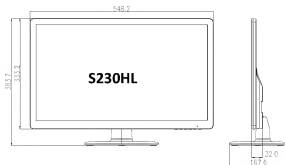
1.6.2 Humidity:

Operating (non-condensing):
20% to 80% Shipping (non-
condensing): 10% to 90%
Storage (non-condensing): 10%
to 90%

1.7 Mechanical and Packing:

Height (including stand)	383.7mm, 333.2mm(without stand)
Depth (including stand)	167.6mm, 32.0mm(without stand)
Width	548.2mm
Pack Dimensions (H x W x L)	600(L)x 397 (W)x 115 (H) mm
Packaged Weight	3.6 kg
Unpacked Unit Weight	2.4kg
40" container loading, palletized	1890units
Maximum Stacking Height	5layers, 2118mm

Dimension(cm):



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2. OSD Menu

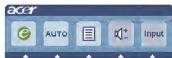
2.1 Key Definition



Key	When OSD display	OSD display
ACER/Menu/Display	1 To display the OSD menu on the screen 2 To select the OSD sub-menu	1 To display the OSD menu on the screen 2 To select the OSD sub-menu
Menu	1 Forward selection of the OSD menu 2 Increase the value after sub-menu selected	1 Forward selection of the OSD menu 2 Increase the value after sub-menu selected
Plus	1 Backward selection of the OSD menu 2 Decrease the value after sub-menu selected	1 Backward selection of the OSD menu 2 Decrease the value after sub-menu selected
Auto	Auto-Adjust Function	Menu or sub-menu EXIT/AUTO Adjust Function
Exit/Powering	Exit/Powering	Monitor sub-menu EXIT/OSD/Menu/Powering

2.2 Function Menu

- 1) Display Function Menu while user press any function button
- 2) Layout as following figure



2.3 Main OSD Menu

2.3.1 OSD layout

- a) Display OSD menu when user press "MENU" button on front bezel
- b) Layout as following figure



- c) OSD layout for each function page



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Settings



Information

d. Icons introduction

Function	Picture	OSD	Setup	Information
Status				
NonFocus				
Focus				
Focus on Itempage				

e. Item page status

Status	Display type
Nonfocus	
Item focused	
Item selected	

2.3.2 Key operation

aKey operation at function icon



Key	Function description
Power	Power off the monitor
a	Moving the focus down
b	Moving the focus up
c	Enter to the item page 1. It has no function at the information page
d	Exit the OSD menu
e	Trigger the acer eColor Management

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b Key operation at items page, No item selected



Key	Function description
Power	Power off the monitor
a	Moving the focus down
b	Moving the focus up
c	Select function item for Sub menu
d	Exit from the item page to icon place
e	Trigger the acer eColor Management

cKey operation at items page, item selected



Key	Function description
Power	Power off the monitor
a	Moving the focus down
b	Moving the focus up
c	Select function item for adjustment
d	Exit from the item page to icon place
e	Trigger the acer eColor Management

dKey operation at items page, item selected



Key	Function description
Power	Power off the monitor
a	Increase the setting value for target item
b	Decrease the setting value for target item
c	No function
d	Exit from item selected status
e	Trigger the acer eColor Management

2.4 Acer eColor management

a Display Acer eColor Management OSD when user press "e" button at Function menu or trigger this function in OSD menu/picture page

b Layout as following figure:



OSD layout for the acer eColor management

2.5 Acer logo:

When the monitor is power on, the LOGO will be showed in the center.



When LOGO disappears, Energy Star logo will be showed on the left-top corner of screen at least 5 seconds.



2.6 OSD Message

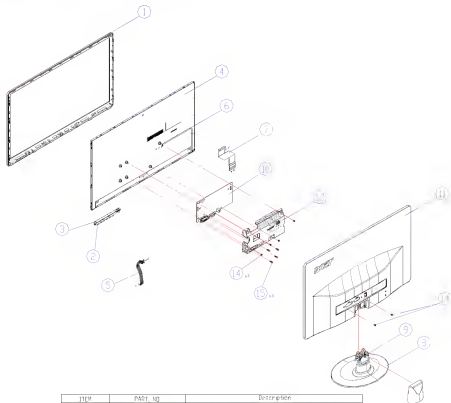
Item	Description
Auto Config Please Wait	When user press hot key "Auto" will show this message, and the monitor do the Auto config function.
Input Not Support	When the Hsync Frequency, Vsync Frequency or Resolution is out of the monitor support range, will show this message. The message will be flying.
Cable Not Connected	When the video cable is not connected, will show this message. This message will be flying.
No Signal	When the video cable is connected, but there is no active signal input, will show this message, then enter power.
Please Wait	After user trigger the reset function, system will show this message notice user the reset is in proceeding.

2.7 OSD Menu Tree

F ¹ Sub	F ² Sub Menu	F ² Sub Menu	F ² Sub	Value	VGA	HDMI	Remark
Picture	Acer Color management				Y	Y	
	Brightness	Slider		100/0-100%	Y	Y	
	Contrast	Slider		100/0-100%	Y	Y	
	W. Position	Slider		50-100%	Y		
	V. Position	Slider		50-100%	Y		
	Gamma	Slider		100/0-100%	Y		
	Color	Slider		100/0-100%	Y		
	Color Temp	Custom		6500K			
		(Warm)		6500K			
		User	Red	0-100			
			Green	0-100			
			Blue	0-100	Y	Y	
	Auto Config				Y		
OSD	OSD Timeout			10/15-120	Y	Y	
	3D Notification			On/Off			
Setting	Wide Mode	Full			Y	Y	
		Aspect			Y	Y	
		16:9			Y	Y	
		16:10			Y	Y	
	OSD	On/Off			Y	Y	
	ACR	On/Off			Y	Y	
	Input	VGA/DVI/HDMI			Y	Y	
	Language	(E-USA)					
		English-French					
		Spanish-Germany					
		Italian-Russia					
		Dutch-Turkish					
		Polish-Portuguese					
		French					
		(E-USA)					
		English-French					
		Spanish-Germany					
		Italian					
		Traditional Chinese			Y	Y	
Information	Serial				Y	Y	
	Resolution						Up of Working
	H/V Frequency				Y	Y	1 VSA
	XXX input						2 x DVI 1
	Serial number						3 HDMI 2

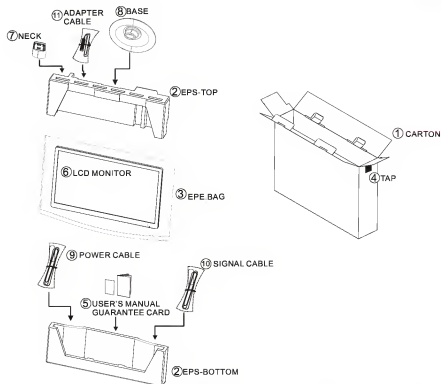
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3-1-1 Product Exploded Diagram (pure A monitor)



ITEM	PART NO	Description
1	10001200010	FRONT BEZEL (ABS 94HR/TS200) (S230HL) ASS'Y
2	17010420100	DISPLAY KEY (ABS 94HR/TS200) (S230HL)
3	05000500156	DISPLAY BR ASS'Y (S230HL)
4	LM230VTS-TJ60	TFT LED LM230VTS-TJ60 (15.5" 1600x1200 150nm/30)
5	045010070500	VH A200-Z/P24017 1051420 150nm/30
6	045020100130	VH FFC 30P 0.5mm 300mm L/T 50VCM0+R35
7	045020000101	VH FFC 50P0.5mm 200mm L/T 50VCM0+R35
8	18000410100	BASE CHIPS 94HR/TS200 (S230HL) ASS'Y
9	18000410100	BASE NECK CHIPS 94HR/TS200 (S230HL) ASS'Y
10	05000500156	MAIN BR ASS'Y (S230HL)
11	18000200000	REAR COVER (CHIPS 94HR/TS200) (S230HL) ASS'Y
12	17010000000	MAIN SHIELDING/SECC 0.5x(S230HL) b00
13	09471800000	GASKET BLOCK (5.0x4.5x10.0mm)
14	17000000000	MAC SCREW-M3 0.5x10.0 BLK-Ni Plating
15	17000144000	MAC SCREW-M3x5 0.5x10.0 BLK-Ni Plating

3.1-2 Packing Exploded Diagram (pure A monitor):

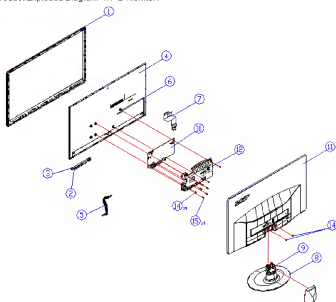


ITEM	QTY	PART	DESCRIPTION	REMARK
①	1		CARTON	
②	1	1925-1001-1070	EPS-TOP	
		1925-1001-1080	EPS-BOTTOM	
③	1	1925-1100-4120	EPE.BAG	
④			TAP	
⑤	1		USER'S MANUAL & GUARANTEE CARD	
⑥	1	3522-0212-0331	LCD MONITOR	
⑦	1	1801-0540-5010	NECK	
⑧	1	1801-0540-4010	BASE	
⑨	1		POWER CABLE	
⑩	1		SIGNAL CABLE	
⑪	1		ADAPTER CABLE	

3. Exploded Diagram

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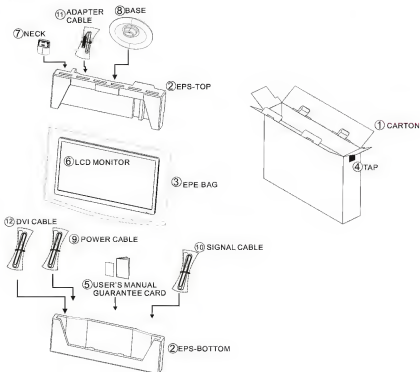
3-2-1 Product Exploded Diagram (A+D monitor)



ITEM	PART. NO.	Description
1	180101388010	FRONT BEZEL(ABS 94HB/T52013)XS230HL)ASS'Y
2	170104231010	DISPLAY KEY(ABS 94HB/T52013 XS220HQL)
3	352200520156	DISPLAY BD ASS'Y (S220HQL)
4	LM215WF4-TJA1	TFT LED LM215WF4-TJA1(RAKEN LCM)
5	46010070510	VH A2001-7/P24017 1061#28 150mm(B)
6	4602B300111	VH FFC 10P (0.5mm) 300mm(2+PROXG/F 90V(AB+B3.5)
7	4602B500151	VH FFC 50P(0.5mm) 200mm(2+DLP)G/F+AL(BA) (A15+AB)
8	180105404010	BASE (HIPS 94HB/T52013 XS220HQL)ASS'Y
9	180105405010	BASE NECK (HIPS 94HB/T52013) (S220HQL) ASS'Y
10	352202220150	MAIN BD ASS'Y (S220HQL)
11	180102335010	REAR COVER (HIPS 94+HB/T52013 XS230HL)ASS'Y
12	171201020950	MAIN SHIELDING(SECC 0.5t)XS220HQL bd)
13	194718000280	GASKET BLOCK (5.8W*3.5H*10.0Lmm)
14	172540030550	MAC. SCREW-MRF M3.0*5.0L BLK_NL_NYLOK
15	172073440520	MAC. SCREW-MHSW H4-40*5.0L(N)

3. Exploded Diagram

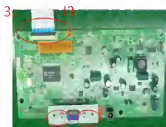
3.2-2 Packing Exploded Diagram (A+D monitor):



ITEM	QTY	PART	DESCRIPTION	REMARK
1	1		CARTON	
2	1	1925-1001-1070	EPS-TOP	
		1925-1001-1080	EPS-BOTTOM	
3	1	1925-1100-4120	EPE.BAG	
4			TAP	
5	1		USER'S MANUAL & GUARANTEE CARD	
6	1	3522-0042-0300	LCD MONITOR	
7	1	1801-0540-5010	NECK	
8	1	1801-0540-4010	BASE	
9	1		POWER CABLE	
10	1		SIGNAL CABLE	
11	1		ADAPTER CABLE	
12	1		DVI CABLE	

4.1 Assembly Procedures (pure A monitor) :

- S1**
1. Tightening the bracket of D-Sub on the Main board with two HEX-head screws
(The HEX-head screw size = MAC SCREW-MHSW #4-40*5.0L,Ni)
 2. Sticking the gasket on the bottom of bracket of D-Sub
(Gasket size = 5.0W*3.5H*10.0Lmm)
 3. Connecting LVDS cable to J3 connector of Main board



1.

- S2**
- 1: Putting the Panel on the protective cushion and let the glass side of panel face us. Then cover it with Front Bezel
 - 2: Turning over the panel Put the main board on it and plug LVDS cable to CN1 connector of source board (T-con)



1

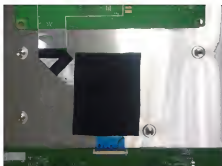


2



3

- S3** Using Acetate cloth tape to stick LVDS cable on the Panel firmly (ACETATE CLOTH TAPE size= 60*80mm)



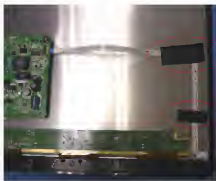
S4

Using the Phillips-head screwdriver to tighten 4 screws to fix Main board on the Panel's UDM (MAC SCREW-MB M3.0*5 0L, BLK-NI, Torque=5±1kgf.cm)



S5

- 1: Plugging in connector of Main board(BJ1 conn) and connector of Panel with the Panel power cable (FFC cable)
- 2: Using the two kinds of Acetate cloth tapes to stick the Panel power cable on the Panel (Tape 1 20*45, Tape 2 12*30mm)



S6

- 1: Taking the wire cable to connect the J1 connector of Main board and J1 connector of OSD key board
 - 2: Using one Acetate cloth tape to stick wire cable (ACETATE CLOTH TAPE = 21*61mm)
 - 3: Putting the OSD key assembly into the hooks of Front Bezel firmly
- ※Don't let the wire cable touch the cable of panel



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- S7** Assembling Rear Cover with the assembled unit. Pressing the Rear Cover to make the hook structure assembled well.



Hook of Rear Cover



Hook of Front Bezel



- S8** Using the Phillips-head screwdriver to tighten bracket of D-sub for fixing on the Rear Cover with two M3 screws.
(Screw size = MAC SCREW-MB M3 0*5 0L,BLK-NI ,Torque=4±1kgf cm)



- S9**
- 1: Putting the Neck into the holes of Rear Cover's bottom area as red square of area shown.
 - 2: Pushing the neck as red arrow shown.

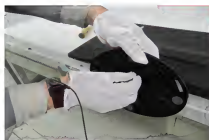


S10

- 1: The base inserts to Neck's bottom after sticking 4 rubber pads
(Pad of foot = SILICON RUBBER/ D18 0*2.0t)(447C)
- 2: Tightening the screw by hand toward clockwise ;
(Screw size = MAC. SCREW M4 0*10 0L,NI)



1



2

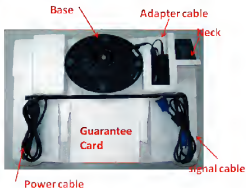
S11

- 1: Lifting up LCD monitor module. Connecting signal cable and power cord to monitor and turn it on for functional inspection. Turn off the monitor and remove the signal cable and power cord from the monitor.
 - 2: Removing the base unit and neck one separately from the monitor assembly
Then take a EPE bag to cover the LCD monitor.
- ※The words of welcome to Acer of EPE bag must be toward front.



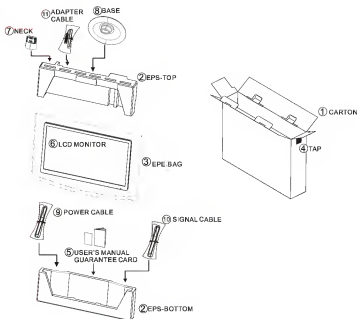
S12

- 1: Putting down Monitor assembly of unit on the EPS-Bottom before putting specific carton
- 2: Placing the folding power cable and the folding signal cable in EPS-Bottom' back
- 3: Then EPS-TOP covers the Monitor assembly of unit after placing the base unit and neck unit and power adapter cable which's position refers the picture



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S13



S14 To seal up the carton



4.2 Assembly Procedures (A+D monitor)

S1 1. Connecting LVDS cable to J3 connector of Main board.



1

- S2
- 1: Putting the Panel on the protective cushion and let the glass side of panel face us. Then cover it with Front Bezel
 - 2: Turning over the panel Put the main board on it and plug LVDS cable to CN1 connector of source board (T-con)



1

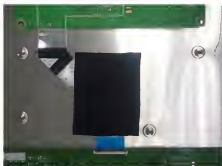


2



3

- S3 Using Acetate cloth tape to stick LVDS cable on the Panel firmly (ACETATE CLOTH TAPE size= 60*80mm)



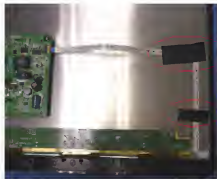
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4 Assembly and Disassembly Procedures

S4 Put The Main board on the Panel's UDM



- S5**
- 1: Plugging in connector of Main board(BJ1 conn) and connector of Panel with the Panel power cable (FFC cable)
 - 2: Using the two kinds of Acetate cloth tapes to stick the Panel power cable on the Panel (Tape 1 20*45, Tape 2 12*30mm)

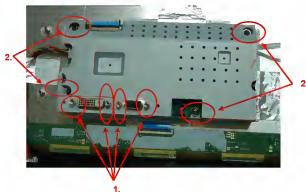


- S6**
- 1: Taking the wire cable to connect the J1 connector of Main board and J1 connector of OSD key board
 - 2: Using one Aluminium tape to stick wire cable (ALUMINIUM TAPE = 21*61mm)
 - 3: Putting the OSD key assembly into the hooks of Front Bezel firmly.
- ※Don't let the wire cable touch the cable of panel.



S7

1. Tightening the bracket of D-Sub/DVI on the Main board with four HEX-head screws
(The HEX-head screw size = MAC SCREW-MHSW #4-40*5.0L,Ni)
- 2 Using the Phillips-head screwdriver to tighten 4 screws to fix Main board and shielding cover on the Panel's UDM
(MAC SCREW-MB M3.0*5.0L,BLK-Ni,Torque=5±1kgf cm)



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4. Assembly and Disassembly Procedures

- S8** Assembling Rear Cover with the assembled unit. Pressing the Rear Cover to make the hook structure assembled well.



Hook of Rear Cover



Hook of Front Bezel



- S9** Using the Phillips-head screwdriver to tighten bracket of D-sub for fixing on the Rear Cover with two M3 screws.

(Screw size = MAC SCREW-MB M3.0*5.0L, BLK-NI, Torque=4±1kgf·cm)



- S10**

1: Putting the Neck into the holes of Rear Cover's bottom area as red square of area shown.

2: Pushing the neck as red arrow shown.



S11

- 1: The base inserts to Neck's bottom after sticking 4 rubber pads.
(Pad of foot = SILICON RUBBER/ D16 0*2.0)(447C)
- 2: Tightening the screw by hand toward clockwise .
(Screw size = MAC. SCREW M4 0*10 0L,NI)



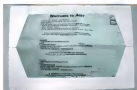
S12

- 1: Lifting up LCD monitor module. Connecting signal cable and power cord to monitor and turn it on for functional inspection. Turn off the monitor and remove the the signal cable and power cord from the monitor
 - 2: Removing the base unit and neck one separately from the monitor assembly
Then take a EPE bag to cover the LCD monitor.
- ※The words of welcome to Acer of EPE bag must be toward front



S13

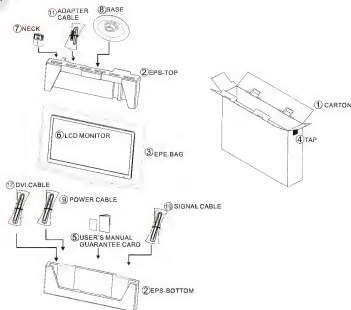
- 1: Putting down Monitor assembly of unit on the EPS-Bottom before putting specific carton.
- 2: Placing the folding power cable and the folding signal cable in EPS-Bottom' back .
- 3: Then EPS-TOP covers the Monitor assembly of unit after placing the base unit and neck unit and power adapter cable which's position refers the picture.



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4 Assembly and Disassembly Procedures

S14



S15 To seal up the carton



4.3 Disassembly procedures (pure A monitor)

S1

Opening the carton with the proper tools after tearing the adhesive tape. Take out base unit, neck unit and all accessories include power core, signal cable, guarantee card, adapter cable and other packing materials from the carton (It depends on whether users return the accessories)



S2

- 1: Taking out the whole EPS cushion that are EPS-top and EPS-bottom from Carton.
- 2: Afterward taking off the EPE bag from LCD monitor assembly after removing all EPS from the LCD monitor assembly

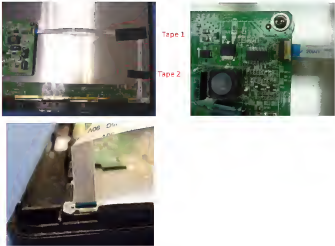


S3

- 1: Because the Neck unit and Base unit already separated from taking out from carton. So it does not have to disassemble these units.
- 2: Preparing the protective cushion to put on working desk and let the LCD monitor assembly to lie it down
- 3: Using a Phillips-head screwdriver to release the two screws from the Rear cover in anticlockwise way.
(Screw size = MAC SCREW-MB M3.0*5.0L,BLK-Ni ,Torque=4±1kgf.cm)
- 4: Turning over the LCD monitor assembly to lie on the protective cushion and the Front Bezel faces top
- 5: Using a proper tool to stretch outside gape of the Monitor. Afterward it is easy to pull the Front Bezel and let it opened
- 6: Removing the Front Bezel from the Rear Cover

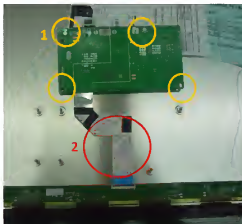


[Go to contents page](#)

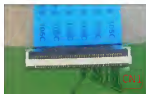
- S4** Removing the Acetate cloth tapes afterward separate the connector of the Panel power cable from the connector of panel and the connector of main Board. (Tape 1 20*45, Tape 2 12*30mm)
- 
- S5** **1:** Tearing the Acetate cloth tapes from the wire cable of OSD key (ACETATE CLOTH TAPE = 21*61mm)
2: Separating the connector of wire cable of OSD key from the connector of main board.



- S6** **1:** Using a Phillips-head screwdriver to release the four screws from the Panel in anticlockwise way. (MAC SCREW-MB M3.0*5 0L, BLK-NI, Torque=5±1kgf.cm)
2: Afterward tearing the Acetate cloth tapes from the LVDS cable



- S7** Separating the connector of LVDS cable from the connector of source board of panel



◀◀ [Go to contents page](#)

- S8** **1:** Turning over the last module and take away the Front Bezel
 2: Leaving the Panel module on the protective cushion.



4.4 Disassembly procedures (A+D monitor)

S1

Opening the carton with the proper tools after tearing the adhesive tape. Take out base unit, neck unit and all accessories include power core, signal cable, guarantee card, adapter cable and other packing materials from the carton. (It depends on whether users return the accessories)



S2

- 1: Taking out the whole EPS cushion that are EPS-top and EPS-bottom from Carton.
- 2: Afterward taking off the EPE bag from LCD monitor assembly after removing all EPS from the LCD monitor assembly



S3

- 1: Because the Neck unit and Base unit already separated from taking out from carton. So it does not have to disassemble these units.
- 2: Preparing the protective cushion to put on working desk and let the LCD monitor assembly to lie it down
- 3: Using a Phillips-head screwdriver to release the two screws from the Rear cover in anticlockwise way.
(Screw size = MAC SCREW-M3 0*5 0L, BLK-Ni, Torque=4±1kgf.cm)
- 4: Turning over the LCD monitor assembly to lie on the protective cushion and the Front Bezel faces top.
- 5: Using a proper tool to stretch outside gape of the Monitor. Afterward it is easy to pull the Front Bezel and let it opened.
- 6: Removing the Front Bezel from the Rear Cover.

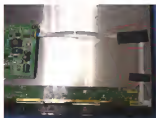


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4. Assembly and Disassembly Procedures

S4

Removing the Acetate cloth tapes afterward separate the connector of the Panel power cable from the connector of panel and the connector of main Board. (Tape 1: 20*45, Tape 2: 12*30mm)



Tape 1.



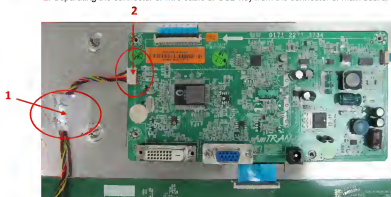
Tape 2



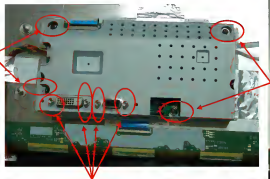
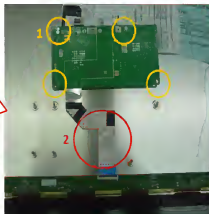
S5

1: Tearing the Aluminium tapes from the wire cable of OSD key (ALUMINIUM TAPE = 21*61mm)

2: Separating the connector of wire cable of OSD key from the connector of main board.



- S6** **1:** Using a Phillips-head screwdriver to release the four screws from the Panel in anticlockwise way. (MAC, SCREW-MB M3.0*5.0L, BLK-Ni, Torque=5±1kgf cm)
2: Afterward tearing the Acetate cloth tapes from the LVDS cable

**1****2**

- S7** Separating the connector of LVDS cable from the connector of source board of panel

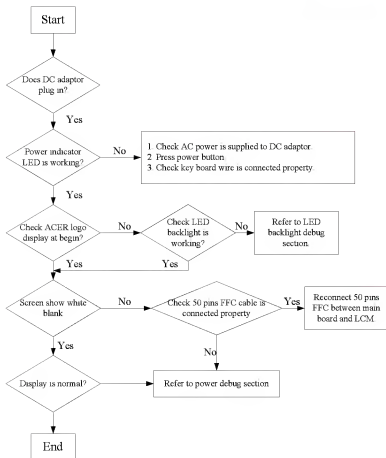


◀◀ [Go to contents page](#)

- S8
- 1: Turning over the last module and take away the Front Bezel
 - 2: Leaving the Panel module on the protective cushion.

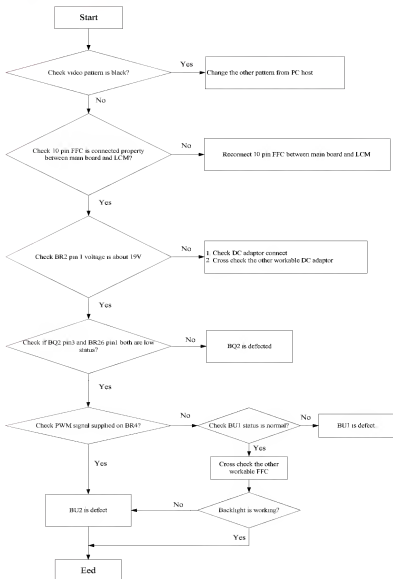


5.1 Test flow for abnormal machine :

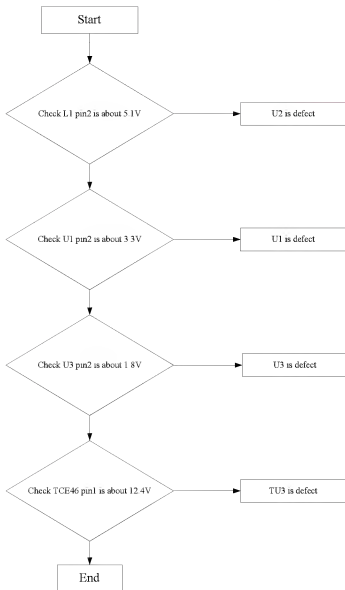


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5.2 LED backlight debug flow



5.3 Power debug flow



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6. Firmware Upgrade Process

6.1 Test Environment Preparation

Before updating S230HL software, the following items must be ready in progress

6.1.1 Hardware Required

- S230HL set*1pcs
- PC with Windows XP
- D-sub cable*1pcs
- USB cable*1pcs

S230HL set *1 pcs



Mstar ISP Board *1 pcs



D-sub Cable*1pcs



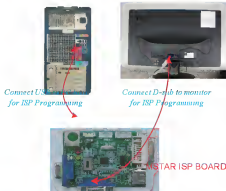
USB Cable*1pcs



6.1.2 Software Preparation

- Mstar utility ISP_Tool.exe
- Latest firmware binary files

6.2 Hardware Configuration



6.3 ISP Programming Procedures

S1 Launch the utility ISP Tool

S2 Press [Connect] button for verifying the ISP connection whether if be established.



S3 Setup communication type, select [Config] option and change 'Port Type' from type list of LPT1, LPT2, and USB per system setting. For example, the USB is selected then press [Auto Detect] button to check its hardware connection. The message [OK] stands for connection successful.



S4 Press 'Read' button  for loading the binary file



S5 Select [Auto] button for entering download menu, then press [Run] button for updating firmware. Once you see the message of 'Pass' shown on the window, it means firmware update is finished.



6.4 How to Check firmware version?

S1 Turn off the monitor, press "Power" and "e" button at the same time for turning on the monitor

S2 Press "Menu" button again to enter factory mode, and you will see the firmware version on the screen.

Note: Please pay attention: Don't change any parameter which is measured by precise machine before shipping out.

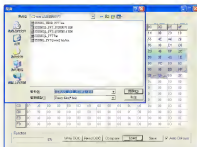
◀ Go to contents page

7.1 Writing EDID Procedure

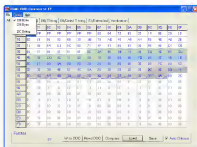
Hardware Configuration Please reference chapter 6 2

7.2 EDID Generator Operation

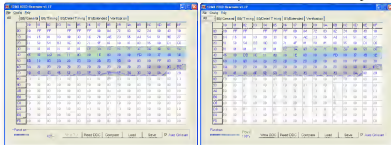
51. Press Load button, and select the binary file which is prepared to update to EEPROM.



52. Check Config setting to 128 Bytes



53. Press "Write" Button to write EDID data EEPROM, verify Function show "Pass!" message.



7 Writing EDID Process

7.3 How to Set Up Language Area

A. Entry Factory Mode by

- Press **ePower Key** + **Power Key** in Power Off.
- Select F Item in Menu Menu

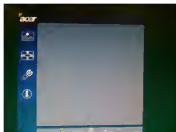


Figure 1 Main Menu with Factory Mode Enabled



Figure 2 Factory Menu

B. Go To Region Item and Select according the following table.

Value	Language Set
0	EMEA
1	Non-EMEA
2	Russia

EMEA	Russia	Non-EMEA
English	Russian	English
French		French
German		German
Italian		Italian
Spanish		Spanish
Dutch		S.Chinese
Finnish		T.Chinese
Russian		Japanese
Polish		
Turkish		
Portuguese		

Figure 3 Language Set

Note: Please Do NOT Change any Other Value in Factory Mode, Unless mentioned in Service Menu.

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7. Writing EDID Process

7.4 How to Calibration(Auto Color) For VGA Port

- C. Enter Factory Mode(Mentioned in Section 0)
- D. Input 5- Mosaic Pattern in VGA Port
- E. Press Auto-Color Item.



Figure 4 5- Mosaic Pattern

Note: Please Do NOT Change any Other Value in Factory Mode, Unless mentioned in Service Menu.

This chapter gives you the FRU (Field Replaceable Unit) listing in global configurations of Acer S230HL. Refer to this chapter whenever ordering for parts to repair or for RMA (Return Merchandise Authorization).

Please note that WHEN ORDERING FRU PARTS, you should check the most up-to-date information available on your regional web or channel. For whatever reasons a part number change is made, it will not be noted on the printed Service Guide. For ACER AUTHORIZED SERVICE PROVIDERS, your Acer office may have a DIFFERENT part number code from those given in the FRU list of this printed Service Guide. You MUST use the local FRU list provided by your regional Acer office to order FRU parts for repair and service of customer machines.

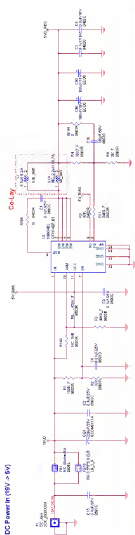
NOTE: To scrap or to return the defective parts, you should follow the local government ordinance or regulations on how to dispose it properly, or follow the rules set by your regional Acer office on how to return it.

Category	Part Name	Description	ACER Part No.
ADAPTOR			
	30070131012	Adapter DELTA 40W 19V 1.7x5.5x11 Black ADP-40PH BB LF for Monitor box	AP 04001 003
BOARD			
	352300620395	MAIN BOAR W/BRAKET,GASKET FOR VGA	55 LTK8K 001
	352300020395	MAIN BOAR W/BRAKET,GASKET FOR VGA/DVI	55 LTK8K 002
	352300520156	KEYPAD BOARD	55 LTK8K 002
CABLE			
	046020500151	FFC CABLE - 50 PIN . PANEL TO MB	50 LTK8K 001
	046020100130	FFC CABLE - 10 PIN . PANEL TO MB	50 LTK8K 001
	046010070610	CABLE - 7 PIN MB TO KEYB	50 LTK8K 003
	032030000180	POWER CORD 1.5M EU 3 PIN	27 LTK8K 001
	032040000320	POWER CORD 1.5M US	27 LTK8K 002
	032050000660	POWER CORD 1.5M AUSTRALIA	27 LTK8K 003

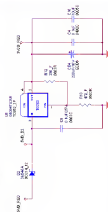


8. FRU (Field Replaceable Unit) List

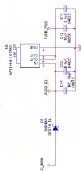
Category	Part Name	Description	ACER Part No.
	032010300079	POWER CORD 1.5M UK	27.LTK3K.004
	032103000930	RGB CABLE 1.5M 15(3R-3R)	50.LTK3K.004
CASE/COVER/BACKET ASSEMBLY			
	180105404011	BASE ASSY W/RUBER	60.LTK3K.001
	180105405011	NICK ASSY	60.LTK3K.002
	180102335010	REAR COVER ASSY	60.LTK3K.001
	180102335020	REAR COVER ASSY FOR VGA/DVI	60.LTK3K.002
	17120102095	MAIN SHIELDING FOR VGA/DVI	33.LTK3K.001
	170104231010	KEY PAD	42.LTK3K.001
LCD			
	352359820395	LED LCD LPL 23"W FHD Non-Glare LK23598F3 TJA1 LF 253ml 5ms W/FRONT BEZEL	LK.23986.022



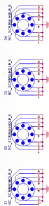
System Power 3.3V (5V → 3.3V)



Core Power 3.3V (3.3V > 1.8V)



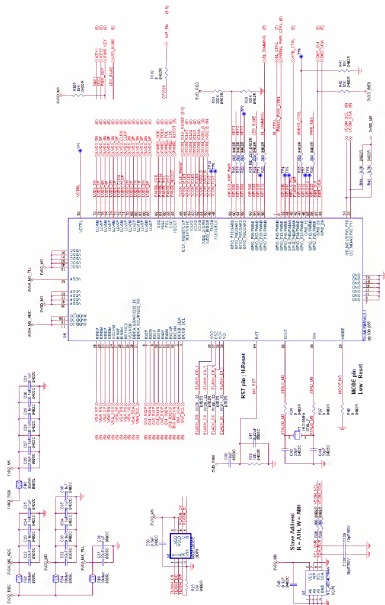
3 screw hole

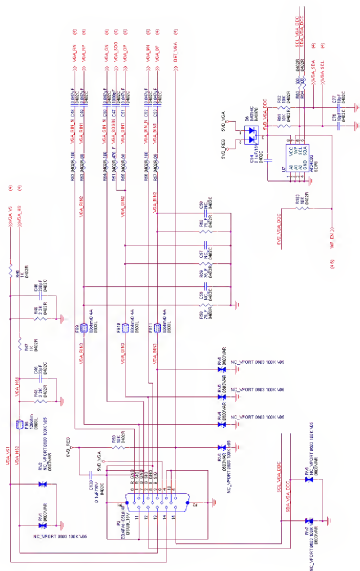


Customer

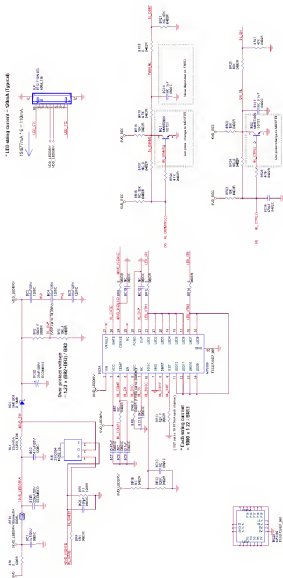


09. Schematics and Layouts

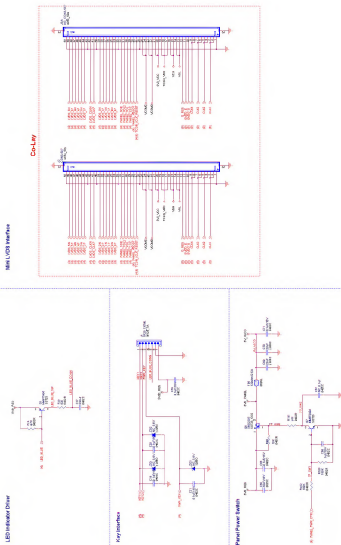




09. Schematics and Layouts

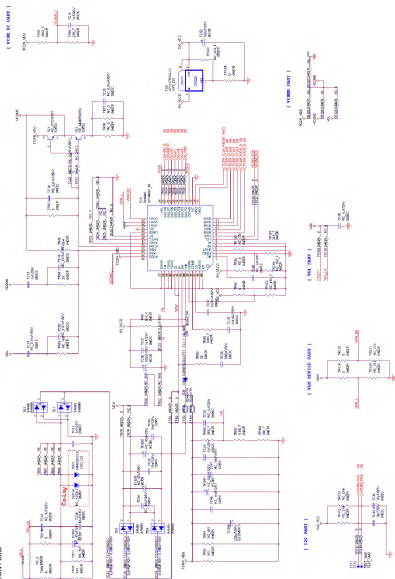


09. Schematics and Layouts

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09. Schematics and Layouts

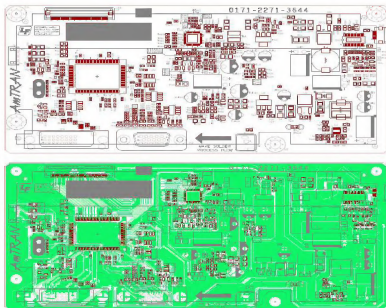
TCON Power



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Pure A monitor PCB Layout

(1) TOP Side

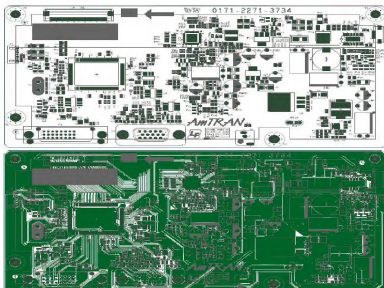


(2) Bottom Side



A+D monitor PCB Layout

(1) TOP Side



(2) Bottom Side

